

Opening the collections to the world: data mobilization of the Cartagena Botanical Garden collections

Programme: BID

Project ID: BID-CA2020-048-INS

Project lead organization: Jardín Botánico de Cartagena “Guillermo Piñeres”

Project implementation period: 1/7/2021 - 30/6/2023

Report approved: 17/7/2023

Final Narrative Report

Executive Summary

The Cartagena Botanical Garden's data mobilisation team finished all the project deliverables and activities. We published the five proposed datasets. We updated the seed bank, living collection, herbarium, flora, and fauna registers and published the datasets as occurrences and checklists through the national node, SIB Colombia. The project's success is reflected in more than 17800 new registers and five new datasets. Published data is of great importance as the Cartagena Botanical Garden houses the most important herbarium plant collection of the Colombian Caribbean, including collections of important botanists and registers from all the Colombian Caribbean counties, Bolívar, Atlántico, Magdalena, La Guajira, Cesar, Cordoba, Sucre, and Caribbean islands are including enhancing data available in the region.

Moreover, the unique seed bank and living collections, the first of their kind in the region, provide new registers to the area. In addition to data publication, we did two workshops to enhance capacity-building in more than 25 young researchers and students regarding data mobilisation tools and processes. We also generated distribution maps and phenological graphs for 100 native species. With this new information available, we aim to contribute and provide information to scientists, decision-makers, and international conservation organisations to prioritise and develop conservation strategies and reference data for ongoing and future research. Also, to close the knowledge gap of native flora and fauna species near urban areas, Cartagena and Turbaco, as urban development poses numerous obstacles to the survival of biodiversity, it leads to the dismissal of coverage of natural areas and generates habitat fragmentation.

Progress against milestones

Has your project completed all planned activities?: Yes

Has your project produced all deliverables: Yes

Report on Activities

Summary of the implementation of the project activities

-We successfully achieved the following activities: update of seed bank current registers, publication of seed bank data, update living collections current records and publication of the living collection data, production of fauna and flora checklists that inhabits the forest patches inside and nearby the garden, publication of fauna and flora checklists, two workshops of data publishing and analysis, distribution maps and phenological graphs for 100 native species, publication of herbarium data and high-resolution images ordered.

-Herbarium update and digitalization were partially achieved due to the data quality of the existing database. We changed the order of the publication to have more time for the physical individual

revision of the herbarium specimens. In the herbarium dataset we addition a registerBy and registerDate columns, indicating review person and date of each herbarium specimen. We aim to participate in future grants to continue this work.

-In addition to the proposed activities, we mounted more than 1000 specimens we trained students in label design and production, specimen storage, recording procedures, mounting herbarium specimens, processing unmounted specimens, and herbarium specimens handling

Completed activities

Activity: Publication of the seed bank data

Description: We published the seed bank data as occurrences in the GBIF and SIB data repositories under a CreativeCommons CC-BY or CC0 license.

Start Date - End Date: 1/2/2022 - 14/3/2022

Verification Sources: <https://www.gbif.org/es/dataset/ce0fda27-7bb2-4e66-bf37-d0e2ecfb593d>

Activity: Update of the seed bank current registers

Description: We reviewed the seed bank collection and registered each accession to generate an updated seed bank database.

Start Date - End Date: 1/10/2021 - 28/1/2022

Verification Sources: <https://www.gbif.org/dataset/ce0fda27-7bb2-4e66-bf37-d0e2ecfb593d>

Activity: Publication of the living collections data

Description: We published the living collections data as occurrences in the GBIF and SIB data repositories under a CreativeCommons CC-BY or CC0 license.

Start Date - End Date: 24/3/2022 - 2/5/2022

Verification Sources: <https://www.gbif.org/dataset/a78cafca-eaa5-4f5d-9040-10ae78dd71a7>

Activity: Update of the living collections current registers

Description: We reviewed the living collections and registered each accession to generate an updated living collections database.

Start Date - End Date: 10/1/2022 - 23/3/2022

Verification Sources: <https://www.gbif.org/dataset/a78cafca-eaa5-4f5d-9040-10ae78dd71a7>

Activity: Production of the flora checklist that inhabits the forest patches inside and nearby the Garden

Description: Considering the data from inventories previously carried out in Cartagena and the Cartagena Botanical Garden and records in Floras and herbarium, we built a list of angiosperm, gymnosperm, and fern species present in the tropical dry forest near Cartagena.

Start Date - End Date: 1/11/2022 - 30/12/2022

Verification Sources: <https://www.gbif.org/es/dataset/ce026ac1-000a-4c6d-a15d-1a983219022d>

Activity: Publication of the Flora checklist

Description: We published the Flora data as a checklist in the GBIF and SIB data repositories under a CreativeCommons CC-BY or CC0 license

Start Date - End Date: 1/1/2023 - 6/2/2023

Verification Sources: <https://www.gbif.org/es/dataset/ce026ac1-000a-4c6d-a15d-1a983219022d>

Activity: Production of the Fauna checklist that inhabits the forest patches inside and nearby the Garden

Description: Considering the data from inventories previously carried out in Cartagena and the Cartagena Botanical Garden, we built a list of vertebrate species (birds, mammals, reptiles, and amphibia) and invertebrates (insects, myriapods, and arachnids) present in the tropical dry forest near Cartagena.

Start Date - End Date: 15/7/2022 - 25/8/2022

Verification Sources: <https://www.gbif.org/es/dataset/7ed622d0-54a4-45b1-9af0-3f06e9a1a279>

Activity: Publication of the Fauna checklist

Description: We published the Fauna data as a checklist in the GBIF and SIB data repositories under a CreativeCommons CC-BY or CC0 license

Start Date - End Date: 3/11/2022 - 12/1/2023

Verification Sources: <https://www.gbif.org/es/dataset/7ed622d0-54a4-45b1-9af0-3f06e9a1a279>

Activity: First Workshop of data publishing and analysis

Description: We led a workshop with the researchers who performed flora and fauna inventories to

share the methodologies learned to analyze and publish data.

Start Date - End Date: 22/10/2022 - 22/10/2022

Verification Sources: <https://www.gbif.org/event/7H6K9yOcqcMiuYKAYsDRG/workshop-on-data-publishing-methodologies>

Activity: Second Workshop of data publishing and analysis

Description: We led a workshop with undergraduate and graduate students of local universities to share the methodologies learned to analyze and publish data

Start Date - End Date: 16/6/2023 - 16/6/2023

Verification Sources: <https://www.gbif.org/event/ef6b28-a3b1-4077-bca6-257e424/data-mobilization-workshop>

Activity: Mapping and phenological information production

Description: For 100 species, we constructed phenological graphs and distribution maps

Start Date - End Date: 1/5/2023 - 30/6/2023

Verification Sources: <https://jbgp.org.co/en/productos-gbif/>

Activity: Capturing and organizing high-resolution images

Description: We organized 11350 high-resolution images of the herbarium specimens

Start Date - End Date: 1/7/2022 - 30/4/2023

Verification Sources: https://archive.org/details/@jardin_botanico_de_cartagena

Activity: Herbarium update and digitalization

Description: We reviewed the current herbarium collection and updated the specimens during the digitalization process.

Start Date - End Date: 1/7/2023 - 31/5/2023

Verification Sources: https://archive.org/details/@jardin_botanico_de_cartagena

Activity: Publication of the herbarium data

Description: We published the herbarium data as occurrences in the GBIF and SIB data repositories under a Creative Commons CC-BY license

Start Date - End Date: 7/6/2023 - 28/6/2023

Verification Sources: <https://www.gbif.org/dataset/fcb4e601-a1d8-44b6-a9d6-75fd05a280ef>

Report on Deliverables

Deliverables - Summary

We reached all deliverables, JBGp Seed Bank Data, JBGp Living Collection Data, Flora from the tropical dry forest patches nearby Cartagena, Fauna from the tropical dry forest patches nearby Cartagena and JBGp Herbarium Data.

For three deliverables, we exceeded the expected number of records, seed bank dataset, living collection dataset and herbarium dataset. For two deliverables the fauna checklist and flora checklist, number of records were fewer than expected. These datasets were based on existing registers, field guides and occurrences, which highlights the limitations in the available information and the knowledge gap. To achieve higher numbers of records, is essential to perform in-situ inventories.

Deliverables produced by the project

Dataset deliverables

JBGp Seed Bank Data

Dataset type: Occurrences

Dataset scope: Angiosperms from Colombia in the seed bank collection of the Cartagena Botanical Garden

Number of records: 1,672

Data holder: Contreras M P Madriñan S

Data host institution: Jardín Botánico de Cartagena "Guillermo Piñeres"

% complete: 100%

Status update: Dataset published

DOI: <https://doi.org/10.15472/8uehrf>

Expected date of publication:

JBGp Living Collections Data

Dataset type: Occurrences

Dataset scope: Angiosperms, Gymnosperms, and ferns specimens from all the continents at the living collection of the Cartagena Botanical Garden

Number of records: 1,403

Data holder: Contreras M P Madriñán S Delvasto M

Data host institution: Jardín Botánico de Cartagena "Guillermo Piñeres"

% complete: 100%

Status update: Dataset published

DOI: <https://doi.org/10.15472/zglyv7>

Expected date of publication:

Flora from the tropical dry forest patches nearby Cartagena

Dataset type: Checklist

Dataset scope: Angiosperms from the Caribbean tropical dry forest near Cartagena

Number of records: 318

Data holder: Contreras M P Madriñán S

Data host institution: Jardín Botánico de Cartagena "Guillermo Piñeres"

% complete: 100%

Status update: Dataset published

DOI: <https://www.gbif.org/es/dataset/ce026ac1-000a-4c6d-a15d-1a983219022d>

Expected date of publication:

Fauna from the tropical dry forest patches nearby Cartagena

Dataset type: Checklist

Dataset scope: Invertebrates (Arachnids, Myriapods and Insects) and vertebrates (Birds, Mammals, Amphibians and Reptiles) from the Caribbean tropical dry forest near Cartagena

Number of records: 266

Data holder: Contreras M P Madriñán S

Data host institution: Jardín Botánico de Cartagena "Guillermo Piñeres"

% complete: 100%

Status update: Dataset published

DOI: <https://www.gbif.org/es/dataset/7ed622d0-54a4-45b1-9af0-3f06e9a1a279>

Expected date of publication:

JBGP Herbarium Data

Dataset type: Occurrences

Dataset scope: Angiosperms, Gimnosperms, ferns and bryophytes specimens data and images

Number of records: 14,208

Data holder: Contreras M P Herrera Y Madriñán S

Data host institution: Jardín Botánico de Cartagena "Guillermo Piñeres"

% complete: 100%

Status update: Dataset published

DOI: <https://doi.org/10.15472/z7hxoq>

Expected date of publication:

Other deliverables

Events

Workshop on data publishing methodologies

Dates: 2022-10-22 - 2022-10-22

Organizing institution: Jardín Botánico de Cartagena "Guillermo Piñeres"

Country: Colombia

Number of participants: 15

Comments: The institution published a post on their social media profile

[https://www.instagram.com/p/CkGajaRA4O_/?](https://www.instagram.com/p/CkGajaRA4O_/?utm_source=ig_web_copy_link&igshid=MzRIODBiNWFIZA==)

[utm_source=ig_web_copy_link&igshid=MzRIODBiNWFIZA==](https://www.instagram.com/p/CkGajaRA4O_/?utm_source=ig_web_copy_link&igshid=MzRIODBiNWFIZA==)

Assistance list is uploaded in the "Report Attachments" section

Website or sources of verification:

<https://www.gbif.org/event/7H6K9yOcqjcmiuYKAYsDRG/workshop-on-data-publishing-methodologies>

Events

Workshop on data mobilization

Dates: 2023-06-16 - 2023-06-16

Organizing institution: Jardín Botánico de Cartagena "Guillermo Piñeres"

Country: Colombia

Number of participants: 13

Comments: The institution published a post on their social media profile

<https://www.instagram.com/p/CtojwuQrym9/>

Assistance list is uploaded in the "Report Attachments" section

Website or sources of verification: <https://www.gbif.org/event/ef6b28-a3b1-4077-bca6-257e424/data-mobilization-workshop>

Communications and visibility

We have started to share our results in the botanical garden social media and website. Additionally, we aim to publish data papers for the most relevant datasets.

We would like to add the following links:

-social media links (Facebook: <https://www.facebook.com/JardinBotanicoCartagena> ,Instagram: @jardinbotanicocartagena)

-workshop content and methodologies published in our website (<https://jbgp.org.co/workshops-gbif/>)

-distribution maps and phenological graphs (<https://jbgp.org.co/en/productos-gbif/>)

Monitoring and evaluation

Final Evaluation

We have evaluated our data set impact according to GBIF metrics and activity:

JBGP Seed bank dataset: This data set was published on March 14th, 2022, and has been cited 27 times, six in 2022 and 21 in 2023. This shows a growing trend in the data impact as the number of citations are rising. During this time, since dataset publication, we have had 12,656 download events.

JBGP Living collection dataset: This data set was published on May 2nd, 2022, and has been cited 16 times, two in 2022 and 14 in 2023. This shows a growing trend in the data impact as the number of citations are rising. During this time, since dataset publication, we have had 5,982 download events.

JBGP Fauna checklist: This data set was published on October 3rd, 2022, and has not been cited and has not had downloads events.

JBGP Flora checklist: This data set was published on February 6th, 2023, and has not been cited and has not had downloads events.

JBGP Herbarium dataset: This data set was published on June 28th, 2023. We have had 26 download events in the first day after publication. Citations and more download events are expected to begin next month, showing a significant growth trend.

Workshops evaluations were made with a survey showing a general satisfactory trend. A recommendation made by a few participants included more hands-on than theory.

The project was managed according to the presented proposal. The project coordinator oversees planning actions and examining alternatives, organizes people to achieve set goals, and provides feedback on processes and results. The administrative assistant was in charge of budgeting and making payments, and the biologist and the students handled data processing. The biologist was changing according to the data set.

The support from the GBIF Secretariat was very effective. They guided us in all the steps of our project. We were in contact with Leonardo Buitrago, a BID Regional Project Support Team member, who was a key person during the project development and dataset publications. He assisted and guided us in all the steps of the project. Data set publication was made through the regional node, SIB Colombia. The process took a little over a month, and they provided satisfactory revisions and comments on the submitted dataset and metadata. We were in contact with Esteban Marentes Herrera, who was an essential person during the dataset publication.

Best Practices and Lessons learned

During the project's development, it was important that the professional in charge of a dataset would complete the process. In the case of the herbarium dataset, a biologist started the process but unfortunately did not complete it. In that case, a new professional was hired, and therefore the new person started the revision again. Also, it is crucial to complete all the dataset metadata before submitting the Dwc file.

We underestimated the amount of work required to review all the herbarium specimens and that this kind of dataset needed several additional steps, for instance, georeferencing.

Post Project activities

We aim to apply to further grants to improve the herbarium dataset quality. An essential factor that would improve it is to accomplish georeferencing of all the occurrences.

Sustainability

Sustainability Plans

We aim to continue curating and digitalising the herbarium dataset and to make a more complete checklist of Fauna and Flora that may involve inventories as available information is limited. Additionally, as the submitted proposal describes, we will maintain and build a more robust network with the local environmental authorities to ensure data usage in the decision-making processes. We will promote the use of this data by private developers and landowners in the area. We will encourage local students and researchers to publish datasets from ongoing research and new biodiversity inventories focussing on Caribbean localities. We will promote data usage among the visitors to the Garden and develop citizen science strategies. We will continue publishing the data that we generate from the collections and the permanent plot of the Garden. And we will apply to future funding opportunities by BID-GBIF as well as other sources, to allow us to continue the data publishing.

Impact of COVID-19 pandemic on project implementation

COVID-19 pandemic did not affect the implementation of our project

GBIF leads the Biodiversity Information for Development (BID), a programme funded by the European Union. The programme provides supplementary support for activities addressing the needs of regional researchers and policymakers through mobilization and use of biodiversity data.

